

February 17, 2017

**EX PARTE NOTICE VIA ECFS**

Ms. Marlene H. Dortch  
Secretary  
Federal Communications Commission  
445 12th Street, S.W.  
Washington, D.C. 20554

**Re: Notice of Ex Parte Presentation  
Universal Service Reform—Mobility Fund, WT Docket No. 10-208**

Dear Secretary Dortch:

On February 16, 2017, Chip Strange, Bryan Darr, and John Gilmer of Mosaik Solutions (“Mosaik”), and Trey Hanbury and Michele Farquhar of Hogan Lovells US LLP, counsel to Mosaik, met with Amy Bender, Wireline Legal Advisor to Commissioner Michael O’Rielly, and Jay Schwarz, Wireline Advisor to Commissioner Ajit Pai. The representatives from Mosaik, as well as Trey Hanbury from Hogan Lovells US LLP, also met with Claude Aiken, Wireline Legal Advisor to Commissioner Mignon Clyburn.

During the meetings, Mosaik distributed the attached presentation and discussed three issues related to the exclusive use of FCC Form 477 data in the Mobility Fund II context.<sup>1</sup> First, undue reliance on government-sponsored data collections threatens to stymie investment and innovation in the commercial market. Service providers in the mobile broadband measurement industry compete using an array of tools and utilities to deliver the most reliable data on commercial mobile broadband availability and performance. The FCC Form 477 data, by comparison, is dated upon release and fails to allow the types of nimble data collection that decision makers need to reach sound public policy.<sup>2</sup> The Form 477 data is also less accurate than the data produced by the private sector.<sup>3</sup> Moreover, the Office of Management and Budget Circular A-76 has directed Federal agencies to rely on commercial providers, not government actors, whenever they can because relying on the private sector helps ensure that Americans “receive maximum value for their tax dollar.”<sup>4</sup> The Commission

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<sup>1</sup> The attached presentation includes one additional slide not included during the meetings.

<sup>2</sup> See John Gilmer, *Improving FCC Datasets & Filling the Right Coverage Gaps*, MOSAIK.COM (Oct. 24, 2016), <http://bit.ly/2kS1FqR>.

<sup>3</sup> See, e.g., Comments of United States Cellular Corporation, WT Docket No. 10-208, at 3 (filed Jan. 12, 2017), <http://bit.ly/2kHUJvr>; *Ex Parte* Notice from Caressa D. Bennet, General Counsel, Rural Wireless Association to Marlene H. Dortch, Secretary, FCC, WT Docket No. 10-208, WC Docket No. 10-90 (filed Oct. 31, 2016), <http://bit.ly/2ltgdRg>.

<sup>4</sup> See *The Federal Activities Inventory Reform Act and Circular A-76*, CONGRESSIONAL RESEARCH SERVICE (Apr. 6, 2007), <http://research.policyarchive.org/19376.pdf>.

should follow that practice here and allow room for private sector investment and innovation in mobile broadband data performance measurement.

Second, the Commission should adopt objectives rather than methodologies for measuring mobile broadband to provide the FCC with the most reliable data while still allowing the competitive mobile broadband measurement industry to innovate and compete on quality. Mobile broadband coverage measurements are more accurate and reliable when the analysis uses diverse datasets and multiple collection methodologies.

The Commission would benefit from the modern, cost effective and efficient network quality testing solutions provided by innovation already occurring in the private sector.<sup>5</sup> Prescribing a set of narrow, strictly defined methodologies will produce inadequate, incomplete or wholly inaccurate data to the detriment of the Commission and the public. To challenge and verify the existence of high-performing mobile broadband networks, acceptable datasets for the challenge process would focus on commercial data collection and analytical services that span a range of industry accepted methodologies.

The attached materials include diverse categories of metadata that may be collected to better determine if networks are available and efficient under the mobile broadband standards defined by the Commission. Mosaik welcomes an opportunity to discuss detailed options and considerations, including (i) consumer crowdsourcing software and resulting analytics, such as Sensorly; (ii) private crowdsourcing software on carrier devices and deployed in the field including Mosaik software development kits and applications; and (iii) traditional drive-test data collection methods.

Third and finally, the challenge period for the data used in the Mobility Fund II context must offer stakeholders sufficient time to study the results, assess the business case of alternatives, commission analysis, independently test areas in question (which may be widely geographically distributed), prepare the analysis and respond to the Commission. This process will require at least ninety days if parties are to have a meaningful opportunity to respond. Providing more time for industry analysis will help validate public need, reduce costs and expand access to broadband in the United States.

Mosaik commends Chairman Ajit Pai for recognizing the vital role of mobile broadband access in the United States. Mosaik also supports the successful execution of the Chairman's digital empowerment agenda and welcomes future opportunities to engage with the Commission.

Pursuant to section 1.1206(b)(2) of the Commission's rules, an electronic copy of this letter is being filed in the above-referenced dockets. Please direct any questions regarding this filing to the undersigned.

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<sup>5</sup> See *Ex Parte* Notice from Michele Farquhar, Counsel, Mosaik Solutions to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-28, GN Docket No. 12-264, WT Docket No. 16-137, WC Docket No. 11-10, WT Docket No. 10-208 (filed Dec. 7, 2016); *Ex Parte* Presentation from Krista Witanowski, AVP Regulatory Affairs, CTIA, and Elizabeth Barket, Law & Regulatory Counsel, Competitive Carriers Association to Marlene H. Dortch, Secretary, FCC (filed Aug. 10, 2016) ("the Commission's mobile speed testing efforts duplicate far more robust efforts well underway by third parties, each of which gather detailed speed testing data that is more expansive and thorough than the MMBA's results").

Respectfully submitted,

*/s/ Trey Hanbury*

Trey Hanbury

Partner

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D 202-637-5663

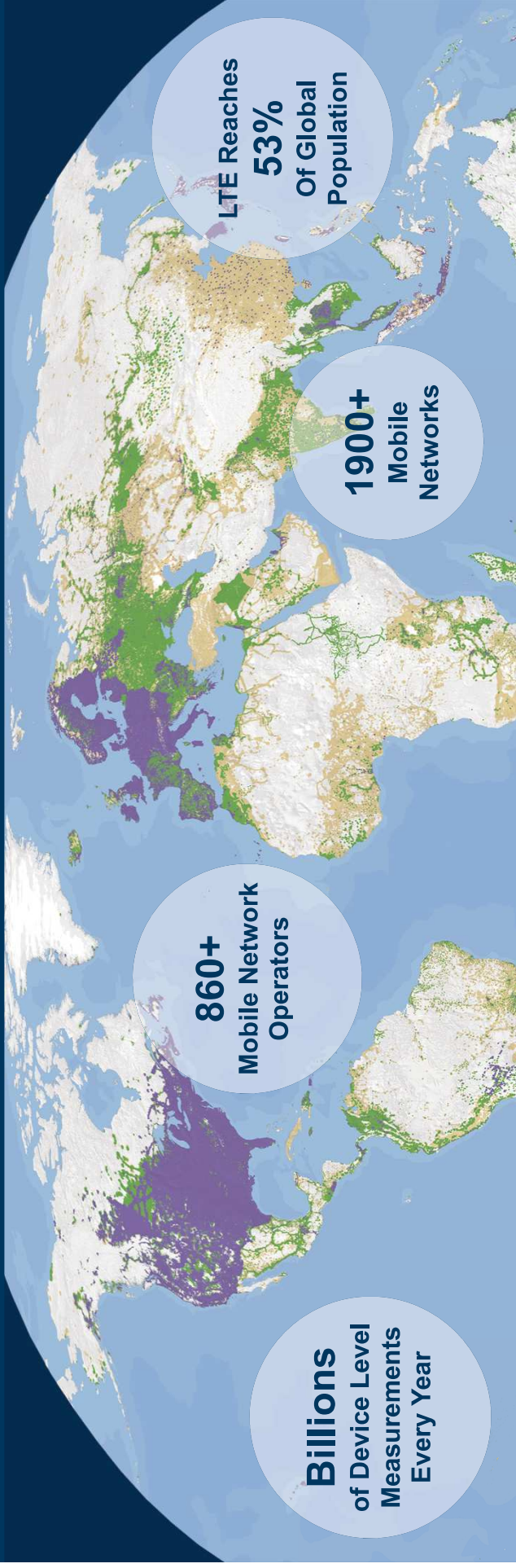
cc: Claude Aiken  
Amy Bender  
Jay Schwarz

Enclosures



# Network Visibility Matters

Mosaik delivers comprehensive datasets and user-friendly applications to bring clarity to network **coverage**, **quality** and **performance**.



# Network Experience Solutions Portfolio

## Performance

### Network QoE

Visibility into the **Network Experience** from the end-user device.

Measure the Network Experience on a large scale with customizable configurations for groups, geographic areas, or equipment types.

Integrate with existing mobile apps via SDKs.

## Intelligence



Available both on iOS and Android, the Sensorly mobile app is used by consumers all over the world to find the best coverage or the best carrier to meet their needs.

### CoverageRight™

Gain industry visibility to compare **Network Experiences** against the competition's.

Global wireless coverage data, including the option of integrating into your internal systems.



Visualize the wireless landscape from a micro or macro-POV to determine network expansion opportunities, forge strategic alliances, respond to RFPs and set customer expectations when on the go.



Visualize the U.S. wireless landscape with the addition of infrastructure assets, fiber and coverage to plan your next site acquisition and deployments.

## Visualization



Provide consumers with visibility to the **Network Experience**. Be transparent. An effective way to communicate your global wireless footprint.

Provide internal workgroups with access to proprietary network coverage and performance data.





# Mosaik Business Intelligence

## Comprehensive telecom network databases

Coverage • Spectrum • Infrastructure • Fiber Routes • Lit Buildings  
Sites • Crowdsourced Network Measurements • Wired Broadband

**Mobile Operators**

*911 Globally*

**Mobile Networks**

*2,210 Globally*

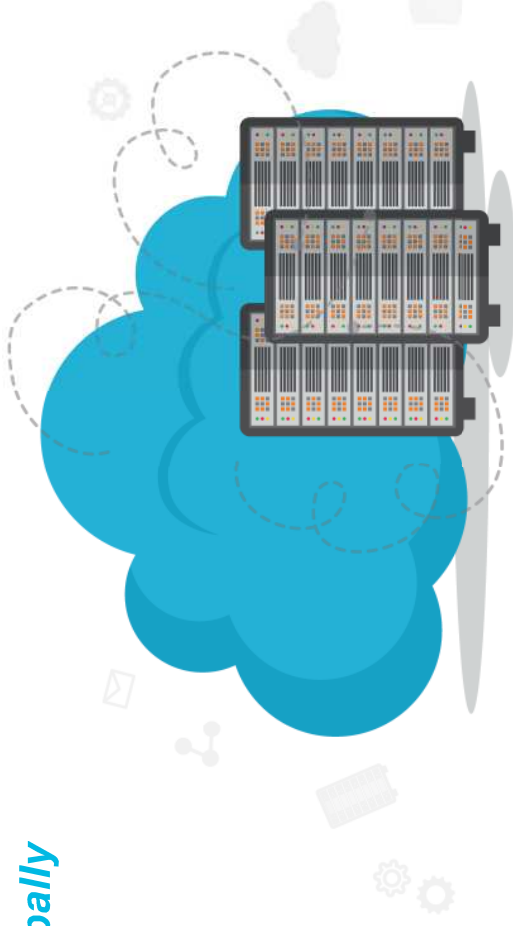
**Infrastructure Assets (U.S. Only)**

*378,266 Total Assets*

*205,926 Active Towers*

**Network Quality Measurements (2016)**

*3 Billion Globally*



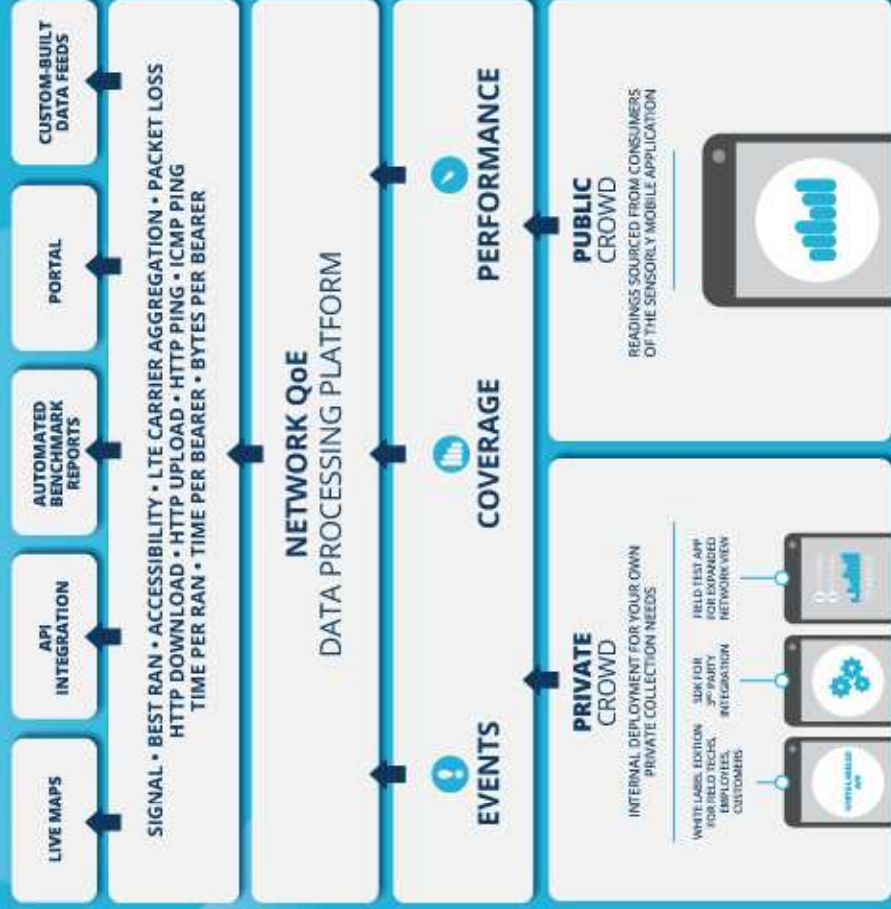


# Network QoE

Quality...from the consumer's point of view.

Network quality measured from the end-user's perspective to fully understand customer experiences.

## How it Works





# How Data is Collected

## Private and Public Crowds –

Mosaik SDKs are the foundation for collecting raw data from end-user devices. Both collection methods (**Private** and **Public Crowds**) are built using these SDKs.



## Private Crowd – Multiple Deployment Options

### SDKs for 3rd Party Integration

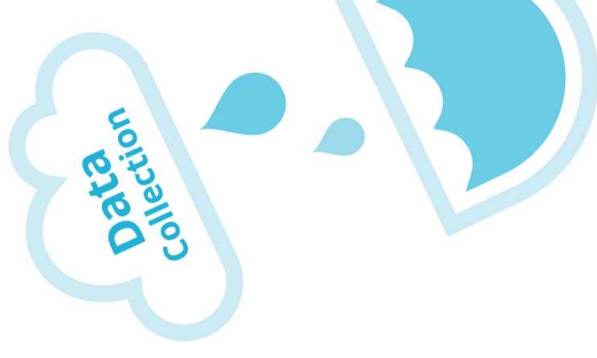
Leveraging flexible SDKs, this deployment extends flexibility and control with seemingly limitless opportunities to collect and analyze network and device metrics. The SDKs can be integrated into existing carrier apps (i.e. customer-facing, customer care, field techs, etc.).

### Carrier Edition App for Customers, Employees and Field Techs

White-label versions of the Mosaik Crowdsourcing apps but equally as robust in collection capabilities. This app is tailored to your brand's look and feel as well as use case (i.e. field techs vs. customers).

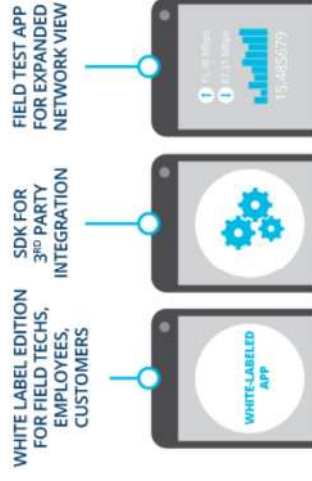
### Field Tech Apps

The primary differentiator from the Carrier Edition is its minimalist design, but it serves as a powerful tool for field employees requiring function over design.



## PRIVATE CROWD

### INTERNAL DEPLOYMENT FOR YOUR OWN PRIVATE COLLECTION NEEDS







# How Data is Collected (cont.)

## Public Crowdsourcing App

Using end-user devices as live sensors, Sensorly brings a different perspective by monitoring and recording actual network performance across all mobile and Wi-Fi networks. Available globally for free on both Android and iOS devices.

## Description and Highlights

See coverage and speed test maps of your carrier's 4G, 3G, 2G or Wi-Fi network, based on actual signal and speed readings provided by other users! See how much time your phone really is connected to your 4G network.

## What consumers get

- Up-to-date coverage maps and speed test maps for 4G, 3G/2G and Wi-Fi networks worldwide.
- A speed test tool: instantly get to know your data transmission speed for 4G, 3G/2G and Wi-Fi networks. Share your results on Facebook, Twitter, Google+ or Pinterest!
- The ability to map your neighborhood:  
Use your daily trips to complete your carrier's coverage map.
- The amount of time you have spent on 4G, 3G/2G or Wi-Fi during the day:  
Are you experiencing networks speeds your carrier promised?

## PUBLIC CROWD

READINGS SOURCED FROM CONSUMERS  
OF THE SENSORLY MOBILE APPLICATION

- Signal and speed test comparison info: who has got the best coverage for you? Make your choice among all networks available around you: AT&T, Sprint, Verizon, T-Mobile. Check if you'll access a 3G network, a 4G network or LTE.





# Mosaik Public Crowd Datasets

Sensorly was developed as an advocate for consumers and quality wireless network signal everywhere. Developed a collaboration with a worldwide community of over 1M downloads.



**500** Maps available  
across **89** countries

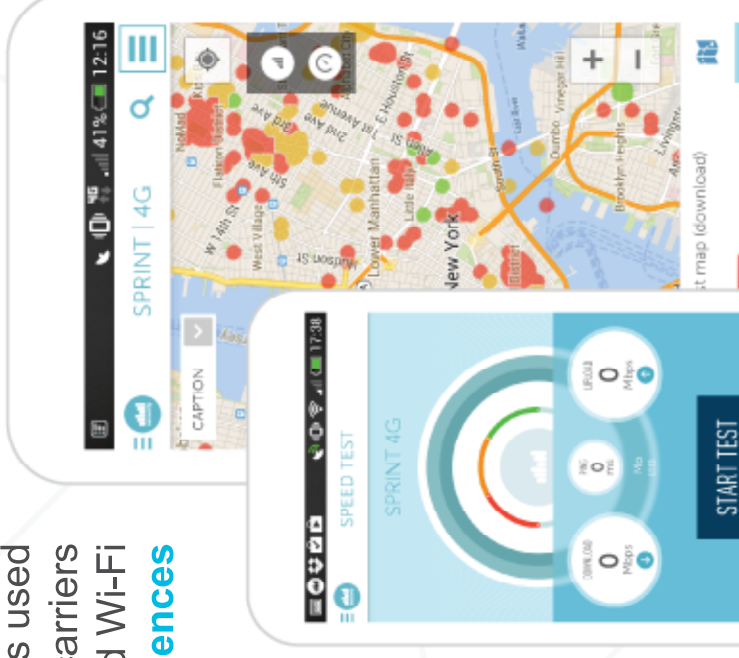
**1 Million+**  
downloads

Applications and SDKs used  
globally by consumers and carriers  
to analyze mobile and Wi-Fi  
**Network Experiences**

**All Wireless  
Technologies**

- 3G
- LTE
- Wi-Fi

**3 Billion**  
Measurements in 2016





# Collection Modes

Three data collection modes enable the SDK to determine **what** data is collected, **when** it is collected and **how often** it is collected. Modes automate data collection based on many different variables, triggered by any number of factors (e.g. if user is outdoors, then outdoor coverage mode is eligible).



## Outdoor Coverage (Active & Passive)

- Data collection mode adapts to measuring coverage and radio conditions while on the move
- If successful, data collection starts and measurements are taken every few seconds until the user stops moving for a few minutes
- Battery consumption limits can be configured
- SDK evaluates the opportunity to collect data every 15 minutes (configurable)
- If successful, data collection starts and measurements are taken every few seconds until the user will stop moving for a few minutes
- Battery consumption limits can be configured
- Wireless state snapshot taken every few seconds when Host application is actively equipped with Mosaik SDK



## Event (Passive)

- Mobile and Wi-Fi connectivity state changes (snapshot taken every few seconds when Host app is actively used)
- Call state change, battery state changes
- OS based location used (coarse location)



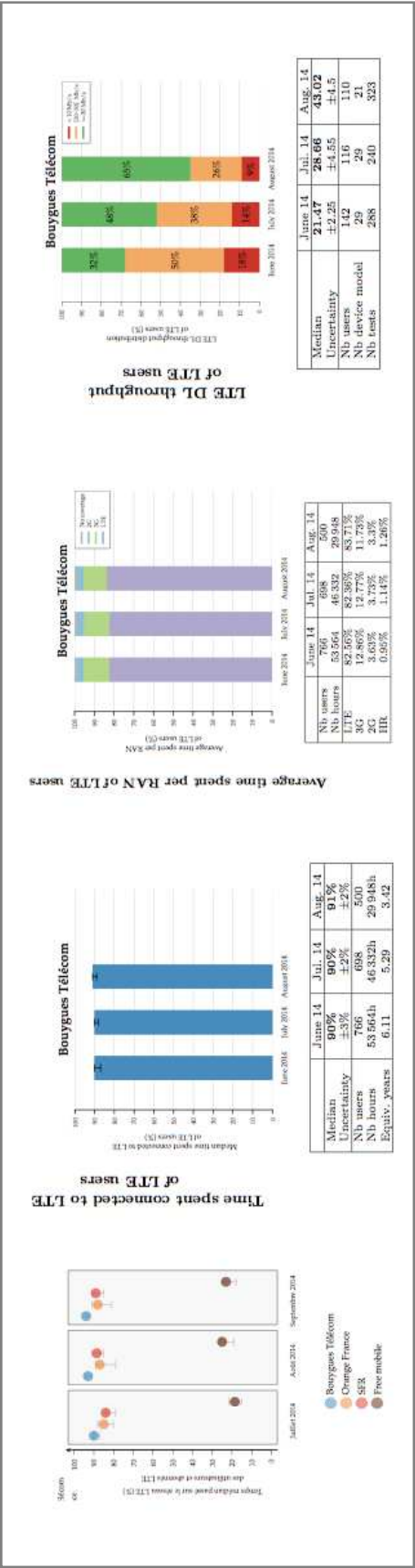
## Performance (Active, Passive & Remote)

- Test scripts can be remotely pushed to devices equipped with SENSORLY SDK
- Target devices can be selected based on location (lat/long or cell ID/lac), network used (e.g. UMTS or LTE) and device brand/model
- Tests scripts are fully configurable from QoE portal



# Example Reports

## 3 KPIs: Median, Average Time Per Ran and Throughput Distribution



### MEDIAN TIME PER RAN

**Graph 1:** Comparison of median time spent (shown as %) on a particular network technology for the carriers you requested.

**Graph 2:** Represents the evolution of median time connected on a particular network technology for one carrier.

**Measures network coverage efficiency.**

### Why 2 graphs?

One to monitor every player's position month after month, and one per carrier with measurement details.

### AVERAGE TIME PER RAN

**Average** Percentage of time spent connected to a given network technology (ie 3G or 4G).

**Measures network usage user experience.**

### THROUGHPUT DISTRIBUTION

Percentage of speed tests performed within a particular geographical area and a period of time per category (excellent, good, bad).

**Measures data performance user experience.**

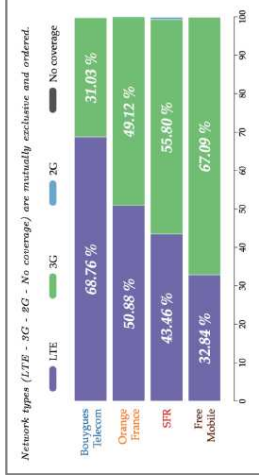
*Benchmark Reports are generated based on geography, period and carriers that you have requested.*



# Example Reports

## 3 KPIs: Best RAN, Performance and Usage per Bearer

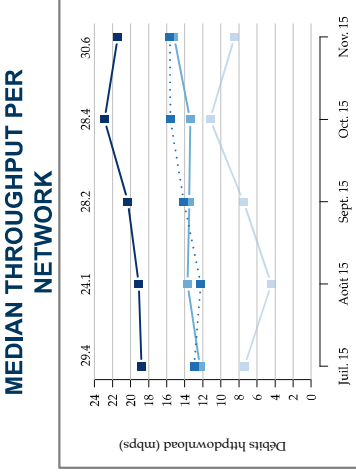
### Coverage Reports



#### Other Coverage Report:

- Signal Strength
- Accessibility
- LTE Carrier
- Aggregation Percentage of Total Places Showing Great or Poor LTE (Indoor Coverage Efficiency metric)

### Performance Reports



#### Other Performance Reports:

- Data Usage per Network (including Wi-Fi)
- Throughput Tests Distribution
- HTTP DL/UL & Ping Results
- Packet Loss

### Usage Reports



#### Other Usage Reports:

- Time per Bearer
- Bytes per Bearer
- Data Usage per Network (incl. Wi-Fi)



# Example Visualizations

**Private & Public Crowd KPIs** – Accessibility and Signal Strength overlaid atop predicted LTE coverage (in gray)

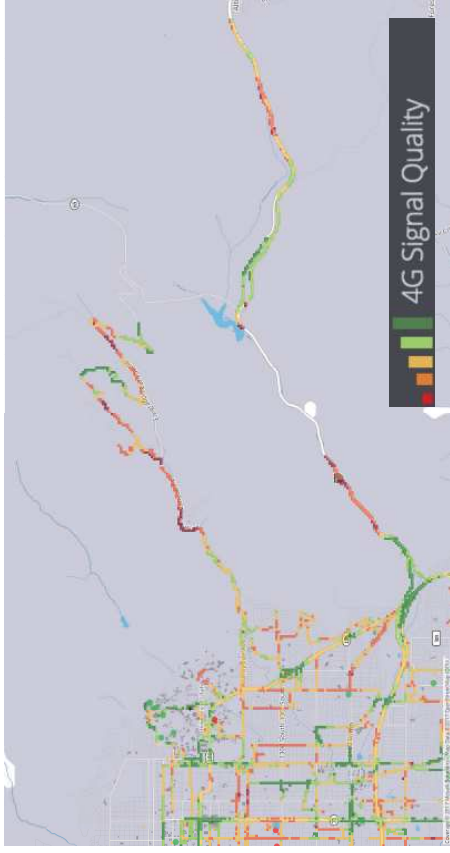
## LTE Accessibility -

Percentage of time LTE was accessible to users



## Signal Strength

Average RSSI of collected signal measurements







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As a strategic partner to mobile  
operators and network-dependent  
solution providers, **we enable clients to  
deliver a superior network  
experience.**